# ITD-783-A DESIGN STANDARDS –Complex

## 1. PROJECT IDENTIFICATION

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|---|---|
| Project No. | Project Tracking, last approved ITD 2101 or last approved ITD 1414. |
| Key No. | Project Tracking, ITIP, approved program, last approved ITD 2101or last approved ITD 1414. |
| Date | Enter Date of Submittal. |
| Project Title | Project Tracking, last approved ITD 2101or last approved ITD 1414. |
| County | Last approved ITD 2101or last approved ITD 1414. |
| Terrain Type | Refer to page 235 of the AASHTO Green Book for guideline definitions of the three terrain types. The *Highway Capacity Manual* also contains general terrain definitions. Sound engineering judgment involving consideration of all factors should be applied. |
| Highway No. | Project Tracking or last approved ITD 1414. |
| MP | Enter Beginning Milepost from Project Tracking, last approved ITD 1414or ITD 2708. |
| MP | Enter Ending Milepost from Project Tracking, last approved ITD 1414or ITD 2708. |
| Functional Class | Highway Needs Report, Admin Policy A-09-02 or Contact Division of Planning. |

## 2. PROJECT TYPE

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|---|---|
| Project Standards | Design Manual Section 6.1.1 Project Determination and Scope |
| Oversight | Attached Oversight Agreement or Design Manual Section 6.1.1 Project Determination and Scope. |

## 3. GENERAL DESCRIPTION

A short description of the work to be done should be added in this area with a note to see attachment. The attached project description or "Draft Design Study Report" must include the purpose and needs for the project as well as a narrative description of the project including any information that clarifies the design intentions and improves the understanding of the project.

## 4. STANDARDS FOR PAVEMENT WIDTH

This includes the total pavement width including lanes and shoulders.

**Note:** Show width for AASHTO **or** State **and** ITD (if corridor plan exists).

Found in the AASHTO *Green Book* and the State Design Standards. ITD uses 3.6 meter (12 feet) travel lanes so the appropriate shoulder width must be applied.

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|---|---|---|
| AASHTO Standard Width | (N/A on non-NHS & NHS 3R projects) | |
| Freeways | 2001 Green Book | Page 508 |
| NHS (Prin. Arterial) | 2001 Green Book | Page 452 Table 7-3 |

| | |
|---|---|
| 3R Standard Width | (N/A on non-3R Projects)<br>3R Improvements, Design Manual, Appendix C |
| State Standard Width | State Design Standards, Design Manual, Appendix C |
| ITD Standard Width | (N/A on Projects w/o corridor plans)<br>Recommended Roadway Widths per corridor plans referenced in Administrative Policy A-14-02. |

Deviation from standard widths will require a design exception and will be justified in the concept report.

## 5. ROADWAY WIDTH

If more than one roadway exists for the project, complete a 783-A for each different segment or attach a table showing the different widths and standards.

For proposed widths on AASHTO Standard Design projects this is defined as the all weather surface width, which is 6:1 or flatter and may include the slope shoe.

The existing widths can be taken from the last set of construction plans or the Highway Needs Report, but field measurements would be prudent. All varying widths should be shown by limits. The existing and proposed typicals must be attached to the report.

## 6. PROPOSED MAXIMUM SUPERELEVATION

An $e_{max}$= 8% is customarily used for the proposed maximum super elevation for any curve within the project.
(See *AASHTO Green Book and Design Manual Section 6.6 for Maximum super elevations)*

## 7. PROPOSED DESIGN VEHICLE

This is the vehicle used in the design of the main alignment and the major intersections. Guidance for the proper vehicle to use for each project is given in the *Design Manual Section 6.10*.

## 8. DESIGN YEAR

The design year for Federal-Aid projects and for complex ST projects is the year the project is shown in the ITD Project Development Schedule plus 20 years plus 2 years (for construction). See *Design Manual 4.6.2, Traffic Volume.)*

## 9. & 10. TRAFFIC ADT& DHV

This information should be for the design year. It may be obtained from the Traffic Survey & Analysis Section by completing an ITD-1151 Traffic Data Request form to obtain projected traffic data on an existing highway or an ITD-19 to obtain traffic data on a proposed route. Show the worst case or highest counts for present and future ADT and DHV in the blank areas. Attach all counts to the report including the turning movement

counts for existing or proposed signal. All the traffic data must be attached to the Concept Report.

## 11. POSTED SPEED

Posted Speed should be the actual posted speed throughout the project.

## 12. DESIGN SPEED

Minimum Design Speeds are found in the AASHTO Green Book and in the State Standards.

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|---|---|---|
| Freeways | 2001 Green Book | Page 507 |
| NHS (Principal Arterial) | 2001 Green Book | Page 448(Rural)& 474(Urban) |
| Non-NHS | State Design Standards | |

ITD uses the general rule of 120 km/h for Interstate, 100 km/h for ramps and state highways, or at least equal to the posted speed. If more than one speed zone exists on a project, list them with limits. They may be placed on a separate sheet if necessary.

3R Projects should have the Posted Speed listed and both the Average Running Speed and the 85$^{th}$ Percentile Speed listed instead of the Design speed. This should be obtained from the District Traffic Section. (See *Design Manual, Appendix C).*

## 13. MINIMUM LEVEL OF SERVICE

Although capacity is not a controlling criteria, a guide for the appropriate level of service can be found on *page 85, Table 2-32, 2001 AASHTO Green Book.* This can be calculated by using the procedures and formulas in the *Highway Capacity Manual.* A P.C. program is available from the Engineering Support Unit to calculate this information. Calculate present LOS and design year LOS. Use the projected design year LOS for the project recommendation. Attach the worksheet or the computer printout to the Concept Report.

## 14. ACCESS CONTROL

State Highway System Only. A list of the existing access control for the State highway system is available from Division of Planning. The proposed Access Control for a project should conform to the "Rural Highways Access Control Guide" map contained in Administrative Policy A-12-01. A change or deviation from the existing Access Control policy will require an ITD-606 to be submitted for approval with the Concept Report and justified in the Concept Report narrative.

## 15. MAXIMUM GRADE

| | | |
|---|---|---|
| Existing | Show Maximum Grade within Project Limits | |
| Proposed | AASHTO Green Book | |
| Freeways | 2001 Green Book | Page 510 Table 8-1 |
| NHS (Principal Arterial) | 2001 Green Book | Page 450 Table 7-2 |
| Non-NHS | 2001 Green Book | (Appropriate Functional Classification Section) |

## 16. MAXIMUM CURVE

Existing – Show the minimum curve radius within the project limits.
Proposed – Show the minimum proposed curve radius within the project limits.

*AASHTO Green Book Table 3-26* shows minimum curve radius for sections with normal cross slopes and *Table 3-14* shows minimum radius using super elevation.

## 17. PROPOSED STRUCTURES

Attach typical section and current bridge inspection reports. This is necessary on all projects with structures over 6 meters in length along the centerline. List all structures located within the project limits. Use a separate sheet or in the Concept Report narrative.

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|---|---|
| Deck Width (c-c) | Deck width curb to curb.<br>*AASHTO Green Book* by appropriate highway function classification. |
| Deck Width (o-o) | Deck width out to out. This includes guard rail, extra deck, curbs, and sidewalks. |
| Vertical Clearance (Rdwy/$Q_{50}$) | This is the minimum vertical difference between:<br>1. Lowest member of the bridge and the roadway below.<br>2. Bottom of the bridge to the $Q_{50}$ water elevation.<br>3. Bridge deck and the lowest overhanging member. (through truss bridges)<br>If the structure crosses multiple features list the minimum vertical clearance for each feature separately in the Concept Report narrative. |
| Existing Bridge Sufficiency Rating | Bridge Inspection Report or Contact Bridge Inspection for the most current information. Attach the Bridge Sufficiency Rating data to the Concept Report. |
| Design Load | All State Highways shall use a minimum of HL-93. Very low volume local roads may use HS-20 if approved by the Bridge Section. |
| Rail Type | Shows the type of Bridge Rail to be used on the structure. Approved types can be found by contacting the Bridge Section or in the Bridge Manual. |

## 18. CLEAR ZONE

Designate a cut and a fill clear zone distance that will typically be applied throughout the project. Distances should be selected from the ranges given in the Roadside Design Guide or the Design Manual using sound engineering judgment.

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| AASHTO | Roadside Design Guide |
| STATE | D.M. C.3.9 & C.3.10 |

**Note:** A P.C. computer program named *Roadside* is available from the Engineering Support Unit to calculate much of the information described in the *Roadside Design Guide*.

## 19. PROPOSED WORK

Check the appropriate general areas of construction, which describe the project. Use the space listed as "other" to list addition major items not shown.

## 20. TRAFFIC SIGNALS

a. Location and type of the existing traffic controller, if any.

b. Proposed location and list the warrants for each particular signal. The work sheet ITD-1415 for the warrants must be attached.

## 21. RAILROAD CROSSING PROTECTION

Location and type of the existing protection devices, if any.

Show proposed location and type of protection proposed and attach Railroad Crossing Report. Headquarters Traffic Section may assist with this information.

## 22. ACCIDENT HISTORY

Accident Base Rate (ACC/MV) can be obtained from the *Safety Evaluation Instruction Manual*, which can be obtained from the Traffic Section.

Existing Accident Rate within Project Limits (ACC/MV) can be calculated using Accident Summary Instructions in the *Safety Evaluation Instruction Manual.*

Spot locations within Project Limits that exceed the Base Rate – List all locations that exceed the base rate.

## 23. PROPOSED IMPROVEMENTS TO REDUCE ACCIDENTS

This must also be addressed in addition to attaching the accident summary.

A safety evaluation form, ITD 2658, must be completed for each safety project. Refer to the *Safety Evaluation Instruction Manual*.

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|---|---|
| **MP** | List the approximate location of each high accident location. |
| **Type of Improvements** | Briefly describe the type of improvements proposed to correct the high accident cause. |
| **Estimated Accident Reduction** | Attach the work sheet (ITD 2658) for each proposed improvement location. |

Note: The ITD 2658 must be completed for projects on the STP-Safety program and for projects on the High Accident Location list.

For the remainder of the projects, N/A may be entered.

## 24. ENVIRONMENTAL

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|---|---|
| Conceptual Environmental Evaluation (ITD 651) Complete | Check yes or no. |
| If no, Explain | Explain the status of the environmental document. |
| Environmental Concerns | Explain the items of concern that may be encountered. |